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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
O HERN, BRENT T	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 08/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/810,342	BRYDEN, RAYMOND H.	
	Examiner	Art Unit	
	Brent T. O'Hern	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *40-81* is/are pending in the application.

4a) Of the above claim(s) *71-81* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *40-70* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *14 February 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 40-70 in the reply filed on 24 July 2006 is acknowledged. The traversal is on the ground(s) that examination of the product and method claims is not an undue burden on the USPTO and the subject matter is not independent and distinct. This is not found persuasive because as stated in the previous office action, dated 23 June 2006, these inventions have acquired a different status in the art in view of their different classification.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 40-42, 44-52 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Sonntag (US 6,143,239).

Regarding claim 40 and 51-52, Sonntag ('239) teaches a ceramic component *(col. 1, l. 7)* comprising a ceramic body comprising silicon carbide *(col. 1, l. 8)* and an oxide layer *(col. 2, ll. 53-57)*.

The phrase "said oxide layer being formed by oxidizing the ceramic body in the presence of alumina having a submicron particle size" in claim 40, lines 2-4 are **process limitations** in product claims and hence not given any patentable weight since patentability of a product does not depend on its method of production *(see MPEP § 2173.05(p))*.

The phrases "wherein the alumima has a particle size less than about 0.8 microns" in claim 51, lines 1-2 and "wherein the alumima has a particle size less than about 0.5 microns" in claim 52, lines 1-2 are **process limitations** (limiting the process limitations of claim #40) in product claims and hence not given any patentable weight since patentability of a product does not depend on its method of production *(see MPEP § 2173.05(p))*.

Regarding claims 41 and 45-46, Sonntag ('239) teaches a ceramic component wherein the ceramic body comprises nitride bonded silicon carbide *(col. 4, ll. 53-57)*.

The phrase "is formed by reacting a green body with nitrogen while heating, the green body containing silicon carbide and silicon" in claim 45, lines 1-3 are **process limitations** in product claims and hence not given any patentable weight since patentability of a product does not depend on its method of production *(see MPEP § 2173.05(p))*.

The phrase "wherein the green body is formed by slip casting a slurry containing silicon carbide and silicon, forming a cast, and drying the cast" in claim 46, lines 1-3 are **process limitations** in product claims and hence not given any patentable weight since patentability of a product does not depend on its method of production *(see MPEP § 2173.05(p))*.

Regarding claim 42, Sonntag ('239) teaches a ceramic component wherein the ceramic body comprises silicon carbide as a primary component *(col. 1, ll. 46-53)* and silicon nitride as a secondary component *(col. 4, ll. 53-57)*.

Regarding claim 44, Sonntag ('239) teaches a component wherein the ceramic body has a porosity within a range of about 5 to about 25 vol% *(col. 1, ll. 21-28)*.

Regarding claim 47, Sonntag ('239) teaches a component wherein the ceramic component is a refractory component *(col. 3, ll. 42-44 and col. 1, ll. 19-21)*.

Regarding claim 48, Sonntag ('239) teaches a component wherein the refractory component is selected from a group consisting of support posts, support beams, support plates, and containers *(col. 1, ll. 19-21)*.

Regarding claim 49, Sonntag ('239) teaches a component wherein the oxide layer comprises silica and at least one of alumina and an aluminosilicate *(col. 4, ll. 42-48)*.

Regarding claim 50, Sonntag ('239) teaches a component wherein the oxide layer includes an aluminosilicate, the aluminosilicate comprising mullite, the mullite having a composition $3Al_2O_3$-$2SiO_2$ *(col. 4, ll. 42-48)*.

Regarding claim 53, Sonntag ('239) teaches a component wherein the oxide layer is a surface layer *(col. 1, ll. 37-40)*.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 43 and 65-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonntag (US 6,143,239) in view of Dussaulx et al. (US 4,990,469).

Regarding claim 43, Sonntag ('239) teaches the component discussed above, however, does not expressly disclose wherein the ceramic body comprises about 5 to about 35 wt% silicon nitride.

However, Dussaulx ('469) teaches wherein the ceramic body comprises about 5 to about 35 wt% silicon nitride (col. 1, ll. 42-45) for the purpose of providing a material exhibiting excellent thermal stability and excellent bending strength *(col. 2, ll. 34-36)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with the above silicon nitride concentration as taught by Hida ('761) in order to provide a component exhibiting excellent thermal stability and bending strength.

Regarding claims 65-66, Sonntag ('239) teaches a nitride bonded silicon carbide having a porosity within a range of about 5 to about 25 vol% *(col. 1, ll. 21-28)*; and an alumina-rich oxide layer *(col. 4, ll. 38-53 and col. 2, ll. 53-57)*, the oxide layer having an amorphous phase *(col. 3, ll. 34-35)* and a crystalline phase *(col. 3, ll. 25-36)*, however, fails to expressly teach wherein the alumina rich oxide layer having at least 5 wt%/(7%) more alumina than an alumina content in the nitride bonded silicon carbide body.

However, Sonntag ('239) teaches alumina concentrations between 3 and 30% and 3 moles Al2O3 for every mole of SiO2 *(see col. 3, l. 56 to col. 4, l. 9 and ll. 38-53)*, thus, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide various concentrations of alumina rich oxide, including

not less than 5 wt%/7 wt% more alumina than an alumina content in the nitride bonded silicon carbide body, as aluminum is not required for the underlying ceramic, for the purpose of providing an oxidation protective layer for the components *(See col. 4, ll. 38-43)*.

The phrase "the oxide layer being formed by oxidizing the ceramic body" in claim 65, lines 4-5 are **process limitations** in product claims and hence not given any patentable weight since patentability of a product does not depend on its method of production *(see MPEP § 2173.05(p))*.

Regarding claims 67, Sonntag ('239) teaches wherein the alumina rich oxide layer is a surface layer *(col. 4, ll. 38-41 and col. 1, ll. 37-40)*.

3. Claims 54-60 and 63-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonntag (US 6,143,239) in view of Hida (US 4,948,761).

Regarding claim 54-60, Sonntag ('239) teaches a ceramic body *(col. 1, l. 7)* comprising silicon carbide *(col. 1, l. 8)* and an oxide layer *(col. 2, ll. 53-57)*, the oxide layer containing an amorphous phase *(col. 3, ll. 34-35)* and a crystalline phase *(col. 3, ll. 25-36)*, and wherein the crystals are alumina *(col. 4, ll. 42-48)*, however, fails to expressly disclose wherein the crystals are anisotropically-shaped with an aspect ratio not less than about 3:1/5:1, with a crystal size of about 0.2 to about 20 microns/ (0.5 to about 10 microns).

However, Hida ('761) teaches wherein the crystals are anisotropically-shaped *(col. 2, ll. 20-28)*, have an aspect ratio not less than about 3:1/5:1 *(col. 2, ll. 22-28)* and with a crystal size of about 0.2 to about 20 microns/ (0.5 to about 10 microns) *(col. 2, ll.*

20-28) for the purpose of providing crystals having very good strength properties *(col. 2, ll. 38-43)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with crystals anisotropically-shaped and having the above dimensions as taught by Hida ('761) in order to provide a component with good strength.

The phrase "said oxide layer being formed by oxidizing the ceramic body in the presence of alumina" in claim 54, lines 2-3 are **process limitations** in product claims and hence not given any patentable weight since patentability of a product does not depend on its method of production *(see MPEP § 2173.05(p))*.

Regarding claim 63, Sonntag ('239) teaches wherein the oxide layer is a surface layer *(col. 4, ll. 38-41 and col. 1, ll. 37-40)*.

Regarding claim 64, Sonntag ('239) teaches a ceramic component *(col. 1, l. 7)*, comprising a ceramic body comprising silicon carbide *(col. 1, l. 8)* and an oxide layer *(col. 2, ll. 53-57)*, the oxide layer containing an amorphous phase *(col. 3, ll. 34-35)* and a crystalline phase *(col. 3, ll. 25-36)*, and wherein the crystals are formed of alumina *(col. 4, ll. 38-53)*, however, fails to expressly teach wherein the crystalline phase comprises anisotropically-shaped crystals.

However, Hida ('761) teaches wherein the crystals are anisotropically-shaped *(col. 2, ll. 20-28)* for the purpose of providing crystals having very good strength properties *(col. 2, ll. 38-43)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with crystals anisotropically-shaped as taught by Hida ('761) in order to provide a component with good strength.

4. Claims 61-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonntag (US 6,143,239) in view of Hida (US 4,948,761) and Hillig (US 4,640,899).

Sonntag ('239) teaches wherein the amorphous phase comprises silica *(col. 3, ll. 34-35 and 42-44)*, however, fails to expressly disclose about 10 wt% to about 50/12 wt% alumina.

However, Hillig ('899) teaches about 10 wt% to about 50/12 wt% alumina *(col. 2, ll. 49-58)* for the purpose of providing a structure exhibiting a high melting temperature and low thermal expansivity *(col. 1, ll. 24-30)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with the above alumina concentrations as taught by Hillig ('899) in order to provide a component exhibiting a high melting temperature and low thermal expansivity.

5. Claims 68-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonntag (US 6,143,239) in view of Hillig (US 4,640,899).

Sonntag ('239) teaches a ceramic component *(col. 1, l. 7)*, comprising a nitride bonded silicon carbide body *(col. 4, ll. 53-57)* having a porosity within a range of about 5 to about 25 vol% *(col. 1, ll. 21-28)*; and an oxide layer *(col. 2, ll. 53-57)*, the oxide layer containing an amorphous phase comprising silica *(col. 3, ll. 34-45)*, however, fails to

expressly disclose wherein the amorphous phase comprises about 10 wt% to about 50 wt% alumina.

However, Hillig ('899) teaches wherein the amorphous phase comprises about 10 wt% to about 50 wt%/ (not less than about 12 wt%)/(not greater than about 25 wt%) alumina *(col. 2, ll. 49-58)* for the purpose of providing a structure exhibiting a high melting temperature and low thermal expansivity *(col. 1, ll. 24-30)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with the above alumina concentration as taught by Hillig ('899) in order to provide a component exhibiting a high melting temperature and low thermal expansivity.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent T. O'Hern whose telephone number is (571) 272-0496. The examiner can normally be reached on M-F, 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon can be reached on (571) 272-2172. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BTO

Brent T O'Hern
Examiner
Art Unit 1772
August 3, 2006

Nasser Ahmad 8/3/06

NASSER AHMAD
PRIMARY EXAMINER